

EFFECT OF GREEN MANURE SPECIES AND THEIR SOWING DATES ON COMMON BEAN CROP

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INTRODUCTION

Nitrogen is the most required nutrient by common bean (*Phaseolus vulgaris* L.). Although common bean can obtain this nutrient from atmosphere by the biological nitrogen fixation (BNF) process, the fixed amounts are not enough to supply all plant necessities (SILVA AND DEL PELOSO, 2006). Under agroecological production systems, part of the required N could be supplied by green manures as an alternative to fertilizers. However, many green manures species show distinct behavior to day length (photoperiod), which causes significant shifts on the phytomass production (CARVALHO AND AMABILE, 2006).

MATERIAL AND METHODS

Aiming to evaluate the effect of different sowing dates (November 28th 2007, January 2nd and February 26th 2008) of green manures (*Crotalaria juncea*, *Crotalaria ochroleuca*, *Cajanus cajan*, *Canavalia ensiformis* and *Mucuna aterrima*) on common bean crop, a field experiment was carried out at the National Rice and Beans Research Center of Embrapa, located in the county of Santo Antônio de Goiás, Goiás, Brazil. Common bean was planted after green manures flowering. The experiment was performed on a randomized block design with three replicates. For each green manure sowing date it were evaluated dry mass (DM) of green manures, number of pods (NP), number of grain per pod (NGP), number of grain per plant (NGPI), 100 grain weight (100GW) and grain yield (GY).

RESULTS AND DISCUSSION

Among the green manures, *C. juncea*, *C. ochroleuca* and *C. cajan* showed greater DM on the first sowing date, *M. aterrima* on the third one and, no effect of sowing date was observed for *C. ensiformis*. *C. juncea* and *C. ochroleuca* showed greater DM production than *C. cajan* and *M. aterrima*, however, GY of common bean had not a direct relation with green manure DM (Figure 1). According to HUXHAM et al. (2005), differences in grain yield may not be directly related to the effect of green manures on nitrogen availability or weed suppression, but to their impact on soil structure. Green manure sowing dates did not affect NP and NGPI, while NGP, 100GW and GY were greater on the second sowing date as compared to the other two ones. Significant Pearson correlations were observed among the studied parameters of common bean crop, however, only NP and NGPI showed a significant and positive correlation with common bean Y (Table 1).

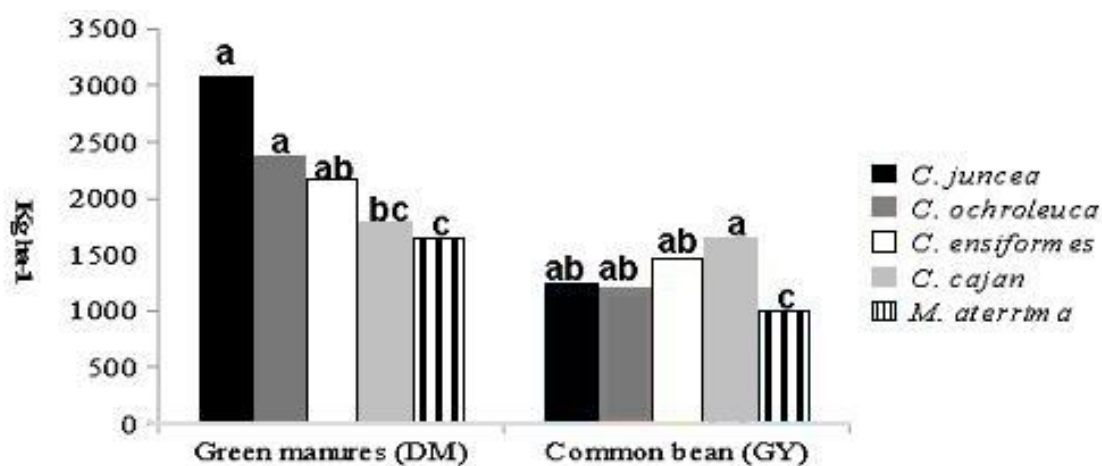


Figure 1: Green manure dry mass (DM) production and grain yield (GY) of common bean cropped after *Crotalaria juncea*, *Crotalaria ochroleuca*, *Cajanus cajan*, *Canavalia ensiformis* and *Mucuna aterrima*.

Table 1: Pearson correlation coefficients among agronomical attributes of common bean.

| | NP | NGP | NGPI | 100GW | GY |
|-------|----------|---------|---------|---------|----|
| NP | 1 | | | | |
| NGP | -0.05 ns | 1 | | | |
| NGPI | 0.79** | 0.56** | 1 | | |
| 100GW | 0.01 ns | 0.12 ns | 0.06 ns | 1 | |
| GY | 0.33* | 0.11 ns | 0.33* | 0.17 ns | 1 |

** - significant correlation ($p < 0.01$); * - significant correlation ($p < 0.05$); ns – non significant correlation.

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